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10/656,256	09/08/2003	Anbo Wang	3811-007-27	8598

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EXAMINER

KIANNI, KAVEH C

ART UNIT PAPER NUMBER

2883

DATE MAILED: 10/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,256

Applicant(s)

WANG, ANBO

Examiner

Kianni C. Kaveh

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-30,32,33,36 and 39-43 is/are pending in the application.
- 4a) Of the above claim(s) 32,33,36 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-31 and 40 is/are rejected.
- 7) ☒ Claim(s) 41-43 is/are objected to.
- 8) ☒ Claim(s) 32,33,36 and 39 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's canceling of claims 1-24, 31, 34-35, 37-38 in the amendment/response submitted on 7/28/06 is acknowledged.

This application contains claims directed to the following patentably distinct species:

Group 1, claims 25-31, and 40-43 are directed to *including* forming a mask over an optical fiber, forming a Fabry-Perot Cavity;

Group II, claims 32, 33, 36 and 39 are directed to *including* forming a Plurality of Fabry-Perot Sensors, as well as at least measuring an amplitude of background noise..... The species are independent or distinct because each of the above group inventions, as described above, has limitation(s) that is directed toward an invention that would require a different search than that of other group inventions and because each of the above species defining an invention that is distinct from that of the other and requiring a different search.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim

Art Unit: 2883

is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

During a telephone conversation with Mr. Heintz on 10/4/06 a provisional election was made with traverse to prosecute the invention of Group I, claims 25-31,40-43. Affirmation of this election must be made by applicant in replying to this Office action. Claims 32,33,36 and 39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 25 and 40 are indefinite sine '*exposing the opening to light*', 4th line of the claim, and '*whereby light propagating..*' lines 6-7 of the claims seem to define the same light

while in the specification the exposure light as in fig. 3a is a laser radiation for purpose of etching/cratering cavity which differs from light traveling in the fiber. Appropriate corrections are required.

Allowable Subject Matter

Claims 41-43 are objected to as being dependent upon a rejected base claim, but would be allowable if non longer their respective base claims are no longer are rejected under 35 USC 112, 2nd Parag., and rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 41 and 42 allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious optical sensors formed therein, the pulse having a duration less than a time required to travel a smallest distance between the two most closely spaced sensors; and wherein the Fabry-Perot cavities are designed such that a cavity length varies only over a quasi-linear range of a half fringe under conditions to which the Fabry-Perot cavities are exposed, respectively, in combination with the rest of the limitations of the base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 25-31 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cielo (US 4400056).

Regarding claim 25 and 40, Cielo teaches a method comprising the steps of: forming a mask /plurality-of-masks 16 over an optical fiber 10, the optical fiber having a core 12 surrounded by a cladding 14, the mask/each-mask 16 having openings 26, the openings of the plurality of masks 16 being spaced a part; exposing the opening/each-of-the-openings 26 to light radiation such that a refractive index of a portion of the fiber corresponding to the opening is changed to form a cavity/discontinuity (see at least abstract corresponding to fig. 1 and 3 having cavity/cavities patterns reflecting/resonating light) and , whereby light propagating in the optical fiber after the cavity is formed is reflected at a first end and at a second end of the portion/each-of-the-portions and propagates backward along the optical fiber (shown in at least fig. 1 and 4, item reflected light from the ends of the portion), light reflected at the first end of the/each portion interfering with light reflected from the second end of the/each portion

Art Unit: 2883

such that changes in a length of the portion result in observable changes in an amplitude of such reflected light (shown in at least figures 1 and 5; also col. 5, lines 1-13);

measuring amplitudes of backward-propagating reflection peaks in the fiber at a plurality of times, each of the times corresponding to a location of one of the portions of the cavities (see abstract and col. 5, lines 1-13); forming a first sensor 30 in an optical fiber 10 (see also col. 1, last parag.-col. 2, 1st parag.); a plurality of sensors 30 are formed in the optical fiber 10; the plurality of sensors 30 being spaced apart; launching an optical light into the optical fiber, the optical fiber having a plurality of optical sensors 30 formed therein, and

measuring amplitudes of a backward-propagating reflection peaks in the fiber at a plurality of times, each of the times corresponding to a location of one of the plurality of optical sensors (see col. 5, lines 1-13; regarding launching of the optical pulse the arguments presented in rejection of claim 40 above).

However, Cielo does not specifically state that the above cavity/discontinuity is a fabry-perot cavity and a step of launching an optical pulse into the optical fiber.

Nonetheless, Cielo states that such cavities form resonators (see abstract). It is obvious/well known to those of ordinary skill in the art when the invention was made that cavity/cavities forming reflective resonators are/known as Fabry-Perot cavity or equivalence (see provided definition of Fabry-Perot Cavity) and since such cavities can also be formed by an artisan skilled in the art in extremely conventional Fabry-Perot fibers and it would also have been obvious to a person of ordinary skill in the art when

Art Unit: 2883

the invention was made to modify launching of light by Cielo into the optical fiber 10 shown in at least fig. 1, as pulsed since such sending of pulse signal instead of an analog signal is extremely conventional and since such pattern of depth(s)/width(s) would provide tunable distribution feedback reflector made in a length of fiber (see col. 1, 1st parag.).

Regarding claims 26-31, Cielo further teaches wherein the exposing step results in a change in a refractive index of the core and/or cladding (see at least abstract); wherein the exposing step is performed using a laser beam (see col. 6, 3rd parag.); wherein the fiber is doped with germanium (see col. 1, 2nd parag.); wherein exposing step is performed using an energized ion beam (see col. 3, lines 45-62; also col. 1, 2nd parag.).

Response to Arguments and Amendment

Applicant's argument filed on 7/28/06 have been fully considered but they are not persuasive. Regarding applicant arguments that by amending the claims would make the claims allowable, the examiner through makes claims 41-43 as allowable subject matter but as stated above claims 25-31 and 40 are taught by the prior art of the record.

Citation of Relevant Prior Art

Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Art Unit: 2883

The Photonics Dictionary, 1996, D-50 Defines Fabry-Perot Cavity

US 6215927 Singh teaches Fabry-Perot optical fiber

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

K. Cyrus Kianni
Primary Patent Examiner
Group Art Unit 2883

**KAVEH KIANNI
PRIMARY EXAMINER**

October 5, 2006

